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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
2622	

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/308,032

Applicant(s)

DIERICKX ET AL.

Examiner

Yogesh K. Aggarwal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/17/2006 has been entered.

obviousness rejections set forth in this Office action:

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (US Patent # 5,949,483) in view of Yonemoto (US Patent # 5,434,619).

[Claim 12]

Fossum et al. teaches an image sensor (figure 3b), comprising an array of pixels (15) comprising a column of pixels;

a pixel column output line coupled to the column of pixels (every pixel column output line is coupled to a column of pixels);

a first switch (figure 9, switch 712a) coupled to the pixel output line; a capacitor (714) coupled to the first switch (712a);

a first crossbar switch (728) having a first input coupled to the pixel column output line and a second input coupled to the capacitor (col. 14 lines 6-20),

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wherein the first crossbar switch has a first output and a second output (a crossbar switch will have a first and second output);

a first column amplifier (722) having an input coupled to the first output of the first crossbar switch, wherein the first column amplifier has an output;

a second column amplifier (722') having an input coupled to the second output of first crossbar switch, wherein the second column amplifier has an output;

a first bus line (710) coupled to the output of the first column amplifier; a second bus line (710 coupled to negative input of 726) coupled to the output of the second column amplifier and an output amplifier (726),

Fossum fails to teach a second crossbar switch coupled to the first and second bus lines. However Yonemoto teaches a crossbar switch (e.g., element 8 of Fig. 3) that is used to switch the two output signals of the amplifying elements of one column to respectively first and second input terminals of said common output. Therefore taking the combined teachings of Fossum and Yonemoto, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have used a second crossbar switch connected to the first and second bus lines and an output amplifier of Fossum in order to reduce the fixed pattern noise.

[Claim 14]

It is noted that in the combination of the references that in order to read out the signal outputted from the first crossbar switch and the second crossbar switch has to be operated synchronously in order for the output of the signal from the first crossbar switch be clocked at a timing when it is inputted to the second crossbar switch.

[Claim 15]

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Fossum teaches when the crossbar switches 728 are closed, it connects the signal bank amplifier 704 with the reset bank 704' (col. 14 lines 6 lines 20). It would be obvious to one skilled in the art that the opening of the crossbar switch in order to connect the signal bank amplifier 704 with the reset bank 704' will occur for each row. Yonemoto teaches that the swap switch 8 repeats a switching action at every two horizontal periods wherein it would be obvious to one skilled in the art that this operation would be repeated for every row (See the definition of modulation on page 10 lines 20-28 in applicant's specification).

[Claim 16]

Fossum teaches an array of pixels comprises rows of pixels, and wherein the first crossbar switch is switched at each of the rows of the pixels (e.g. figure 9 shows multiple rows). Yonemoto teaches a second crossbar switch (8) that is switched for each row of pixels (figure 3)

[Claim 17]

Fossum teaches wherein a first signal stored on the capacitor goes to the input of one of the first and second column amplifiers and wherein a second signal on the pixel column output line goes to the input of the other one of the first and second column amplifiers (col. 13 line 38-col. 14 line 20).

[Claim 21]

Yonemoto teaches synchronous switching being performed by the S/h (6a and 6b) and second crossbar switch (8) and wherein the second crossbar switch is coupled to the first and second bus lines (e.g., element 8 of Fig. 3, figure 4 details the timing) but fails to teach wherein the synchronous switching is performed using first and second crossbar switches, the first crossbar switch, having a first input coupled to the pixel column output line and a second input coupled to

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the capacitor, wherein the first crossbar switch has a first output and a second output, wherein the first output of the first crossbar switch is coupled to a first column amplifier, wherein the second output of the first crossbar switch is coupled to a second column amplifier, the first and second output amplifiers being coupled to first and second bus lines, respectively.

However Fossum et al. teaches a first crossbar switch (728) having a first input coupled to the pixel column output line and a second input coupled to the capacitor (col. 14 lines 6-20), wherein the first crossbar switch has a first output and a second output (a crossbar switch will have a first and second output), wherein the first output of the first crossbar switch is coupled to a first column amplifier (722), wherein the second output of the first crossbar switch is coupled to a second column amplifier (722'), the first and second output amplifiers being coupled to first and second bus lines (710 being coupled to the positive and a second bus 710 coupled to negative end of the differential amplifier respectively). It is also noted that in order to read out the signal outputted from the first crossbar switch and the second crossbar switch has to be operated synchronously in order for the output of the signal from the first crossbar switch be clocked at a timing when it is inputted to the second crossbar switch.

Therefore taking the combined teachings of Yonemoto and Fossum, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have the synchronous switching is performed using first and second crossbar switches, the first crossbar switch, having a first input coupled to the pixel column output line and a second input coupled to the capacitor, wherein the first crossbar switch has a first output and a second output, wherein the first output of the first crossbar switch is coupled to a first column amplifier, wherein the second output of the first crossbar switch is coupled to a second column amplifier, the first and second

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output amplifiers being coupled to first and second bus lines in order to reduce the fixed pattern noise.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (US Patent # 5,949,483), Yonemoto (US Patent # 5,434,619) and in further view of Hamasaki (US Patent # 5,335,008).

[Claim 13]

Fossum teaches a second switch (718') coupled between the output of the first column amplifier and the first bus line (710) but fails to teach a third switch coupled between the output of the second column amplifier and the second bus line. However Hamasaki teaches a third switch (17-1 or 17-2, figure 1) coupled between the output of amplifiers 16-1 and 16-2. Therefore taking the combined teachings of Fossum, Yonemoto and Hamasaki, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have a third switch coupled between the output of the second column amplifier and the second bus line in order to have the signal transferred from the amplifier to the output bus at an appropriate time due to the action of the switch.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonemoto (US Patent # 5,434,619).

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[Claim 18]

Yonemoto teaches a method of operating an image sensor having an array of pixels (figure 3) comprising storing a first signal on a memory element of the image sensor (e.g. S/H1 and S/H2 6a and 6b store s first signal and output as Out1, col. 6 lines 20-47), receiving a second signal on pixel column output line of an image sensor; and synchronously switching between outputting the first signal and the second signal (col. 7 line 4- col. 8 line 18, figure 4 teach two signals pixel + noise and noise signals being switched between outputting the first and second signal).

[Claim 19]

Yonemoto teaches further comprising modulating the synchronous switching at each of row of the array of pixels (col. 7 line 4- col. 8 line 18, figure 4) .

[Claim 20]

S/H elements 6a and 6b in Yonemoto comprise a capacitor to hold the signal and a switch coupled to a capacitor. It is noted that the switch is being coupled to the pixel column output line.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 22 and 23 are rejected under 35 U.S.C. 102(e) as being by Fossum et al. (US Patent # 5,949,483).

[Claim 22]

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Fossum et al. teaches an array of pixels (figure 3b, pixel 15) comprising a plurality of pixel columns. Fossum teaches that in order to suppress fixed pattern noise at each of the columns crossbar switches 728 are used (col. 14 lines 6-20). [Applicant's specification teaches when a signal passes through a column amplifier there is a fixed pattern noise referred to as the average offset voltage0, Page 10 lines 9-14].

[Claim 23]

It would be inherent that the plurality of crossbar switches 728 would have to be switched synchronously in order to close them at a time when the signal bank is to be connected to the reset bank in order to have a differential amplifier 726 generate an output when the crossbar switches 728 are closed thereby generating a signal free of fixed pattern noise (col. 14 lines 6-20).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571)-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YKA

October 27, 2006



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